

REMARKS

This Reply is organized under appropriate subheadings for the convenience of the Examiner.

Amendments to Claims 28, 32-34, 56-60 and 64 and New Claims 131-140

Claims 28, 32-34, 56-60 and 64 have been amended and new Claims 131-140 have been added to more clearly define that which Applicants regarded the invention. Support for amendments to the claims and new Claims 131-140 can be found throughout the specification. For example, page 18, lines 16-18; page 19, lines 17-20; page 20, lines 15-16; page 21, lines 1-11; page 29, lines 3-18; page 30, line 6 through page 32, line 5; page 40, lines 20-26; and page 41, lines 6-10, describe NAD-dependent deacetylation by Sir2 proteins and fragments thereof and agents that can alter the NAD-dependent deacetylation of proteins in an organism or a cell, thereby providing support for amendments to Claims 28, 32-34, 56-60, and 62. Page 41, lines 1-5 describe isolated Sir2 proteins, including isolated, recombinant proteins, thereby providing support for new Claims 131-134. Page 43, line 25 describes Sir2 protein for use in the methods of the invention as a human Sir2 protein, thereby providing support for new Claims 135 and 136. Page 37, lines 8-9; page 40, lines 20-26; page 41, lines 10-12; page 42, line 19 through page 43, line 2; Figures 12a and 14a; and SEQ ID NOS: 2-5 and 9-24 describe and depict core domains of Sir2 proteins, thereby providing support for new Claims 137 and 138. Page 28, lines 20-24, describe a nuclear protein, thereby providing support for new Claims 139 and 140. No new matter has been added to the amendments to Claims 28, 32-34, 56-60, and 64 and new Claims 131-140. Entry is requested.

Amendments to the Specification

The specification has been amended to update the related applications paragraph with respect to the issuance of U.S. application No: 09/461,580 as U.S. Patent No: 7,452,664, correct inadvertent typographical errors and to properly identify trademarks. No new matter has been added in the amendments to the specification. Entry is requested.

Applicants' Claimed Invention

Applicants' claimed invention, as amended, is directed to a method of identifying an agent that alters life span of an organism. Applicants' claimed method, as amended, includes measuring NAD-dependent deacetylation activity of a Sir2 protein or a fragment of a Sir2 protein with respect to at least one amino acid in an acetylated protein in the organism in the presence of an agent. A decrease in NAD-dependent deacetylation activity of the Sir2 protein with respect to at least one amino acid in the acetylated protein in the organism in the presence of the agent compared to NAD-dependent deacetylation activity of the Sir2 protein with respect to that amino acid in the acetylated protein in the absence of the agent identifies an agent that decreases the life span of the organism. An increase in NAD-dependent deacetylation activity of the Sir2 protein with respect to that amino acid residue in the acetylated protein in the organism in the presence of the agent compared to the NAD-dependent deacetylation activity of the Sir2 protein with respect to at least one amino acid in the acetylated protein in the absence of the agent indicates that the agent increases life span of the organism. In an embodiment, the Sir2 protein is an isolated Sir2 protein, for example, a human Sir2 protein. The methods of the invention, can employ an isolated fragment of a Sir2 protein that includes at least a core domain of the Sir2 protein. In an embodiment, the isolated Sir2 protein is a nuclear protein.

Applicants' claimed invention has several advantages. For example, Applicants' claimed methods can identify agents useful for promoting or increasing lifespan of an organism which can promote chromatin silencing and longevity of the organism, as described, for example, on page 92, lines 1-15 of Applicants' specification.

Priority Claim Under 35 U.S.C. §§ 120 and 119(e)

The Examiner acknowledged Applicants' claimed priority to U.S. Application No.: 09/461,580, filed December 15, 1999. However, the Examiner stated that Applicants have not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. §§120 and 119(e). The Examiner further stated the current status of the application to which the above-referenced application claims priority must be contained in the specification and make specific reference to the prior application in the first sentence of the specification.

The above-referenced application was filed on December 13, 2000. Page 1 of the specification of the application, as filed on December 13, 2000, included a related applications

paragraph that made specific reference to the current application as a continuation-in-part application of U.S. Application No.: 09/461,580, filed December 15, 1999, as shown in a copy of page 1 of the application, as filed on December 13, 2000, attached as an Exhibit to this Reply. In this Reply, Applicants have amended the Related Applications paragraph to specify that U.S. Application No. 09/461, 580, filed December 15, 1999, is a now U.S. Patent No: 7,452,664. Therefore, the above-referenced application contains specific reference to the prior application in the first sentence of the specification and no further amendments to the specification are required.

Objections to the Specification

The Examiner stated that there are occurrences of the improper use of trademarks in the application and requested Applicants review the entire specification to correct any improper use of trademarks.

Applicants have amended the application to properly identify trademarks and to correct inadvertent typographical errors.

Rejection of Claims 28-41 and 56-64 Under 35 U.S.C. §112, First Paragraph

Claims 28-41 and 56-64 were rejected under 35 U.S.C. §112, first paragraph as failing to comply with the written description requirement. The Examiner stated that the claims are drawn to a vast genus of proteins, wherein a change in the NAD-dependent deacetylation status of at least one amino acid in the unnamed protein alters the life span of an organism. The Examiner further stated that Applicants must adequately describe the specific acetylation status in a given protein that would alter the lifespan of a given organism. In support the rejection, the Examiner cited the Guidelines for Examination of Patent Applications Under 35 U.S.C. §112, paragraph 1, published in the Federal Register on January 5, 2001.

Applicants have cancelled Claims 35-41 and 63, thereby obviating the rejection of these claims.

Applicants' claimed invention, as set forth in remaining amended Claims 28-34 and 56-62 and 64, is directed to a method of identifying an agent that alters the lifespan of an organism by measuring NAD-dependent deacetylation activity of the Sir2 protein or a fragment thereof

with respect to at least one amino acid residue in an acetylated protein in the organism in the presence of the agent. A decrease in NAD-dependent deacetylation activity of the Sir2 protein with respect to that amino acid residue in the acetylated protein in the organism in the presence of the agent compared to NAD-dependent deacetylation activity of the Sir2 protein with respect to that amino acid residue in acetylated protein in the absence of the agent indicates the agent decreases the life span of the organism. Likewise, an increase in NAD-dependent deacetylation activity of the Sir2 protein with respect to that amino acid in the acetylated protein and the organism in the presence of the agent compared to the NAD-dependent deacetylation activity of the Sir2 protein with respect to at least one amino acid in the acetylated protein in the absence of the agent indicates the agent increases the life span of the organism. Applicants' claimed invention, as amended, requires an alteration (an increase or a decrease) in NAD-dependent deacetylation activity of the Sir2 protein with respect to an amino acid residue of an acetylated protein.

Alterations in the NAD-dependent deacetylation activity of Sir2 protein and the increase or decrease in the lifespan of an organism are described in Applicants' specification, for example, page 19, lines 17-22; page 20, line 3 through page 21, line 11; page 24, line 15 through page 25, line 23; page 29, lines 3-18; and page 30, line 17 through page 32, line 16. Page 25, line 27 through page 26, line 1, describes organisms for use in Applicants claimed method. In addition, Applicants described methods, such as electron-spray or matrix assisted laser desorption/ionization (MALDI) mass spectroscopy, for example, on page 20, lines 27-28 and the use of such techniques on page 84, line 23 through page 86, line 3, to assess NAD-dependent deacetylation activity of a Sir2 protein. Applicants also describe and provide amino acid and nucleic acid sequences, such as SEQ ID NOS: 2-5 and 9-24 of Sir2 proteins for use in the claimed method, including a description of domains of Sir2 proteins and mutant proteins as described, for example, on page 40, lines 11-26. Therefore, Applicants specification provides an adequate written description for the claimed method, as amended. Thus, Claims 28-34 and 56-62 and 64 meet the requirements of 35 U.S.C. §112, first paragraph.

Supplemental Information Disclosure Statement

Applicants are filing with the Reply a Supplemental Information Disclosure Statement (SIDS). Entry of the SIDS is respectfully requested.

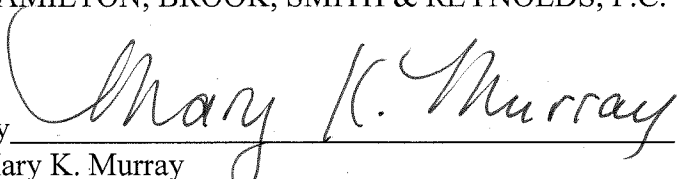
SUMMARY AND CONCLUSION

The specification provides an adequate description to support Applicants' claimed invention, thereby meeting the requirements of 35 U.S.C. §112, first paragraph. In view of the above amendments and remarks, it is believed that all claims are in condition for allowance and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By



Mary K. Murray

Registration No. 47,813

Telephone: (978) 341-0036

Facsimile: (978) 341-0136

Concord, MA 01742-9133

Date: *March 14, 2011*